Abstract

High Hardness Armor (HHA) Steel is widely used as structure of military vehicles for penetration protection because of its high strength, hardness and toughness to weight ratio. However, due to a complex structure of armored vehicle, the welding process of HHA steel is difficult to perform. Therefore, it is vital to develop welding procedure of this steel to be easily manufactured and cost effective. Gas metal arc welding (GMAW) was selected for this paper. It is easily welded and can be utilized to all welding position. ER307 and ER80S-G welding wires were comparatively studied on 6 mm thickness of single-vee groove butt joint welded without backing plate. Non-preheat and preheat (150°C) conditions were also applied on each type of welding wire. The obtained result shows that tensile strength and Charpy v-notch impact energy is higher than 750 MPa and 40 J/mm^2 respectively for all welding conditions. For preheat condition, ER80S-G welding wire provided higher strength than non-preheat condition. Whereas, ER307 welding wire provided lower strength in preheat condition when compared to non-preheat.

Keyword - Gas metal arc welding (GMAW) ,Welding procedure specification (WPS), High hardness armor steel, *Welding wire*